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(71) Applicant: FINALI CORPORATION [US/US]; Suite 100, 10225 Westmoor Drive, Westminster, CO 80021 (US).

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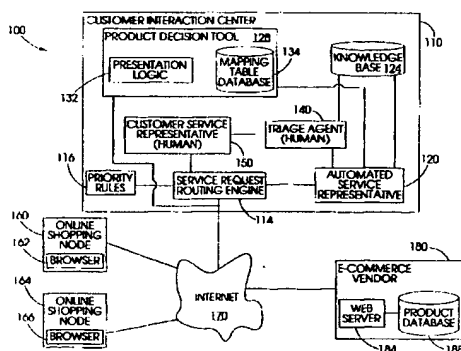
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(72) Inventor: GOSLING, Scott, M.; 31931 Warrens Road, Golden, CO 80403 (US).

(74) Agents: STACY, Wayne, O. et al.; Cooley Godward LLP, Attn: Patent Group, Reston Town Center, 11951 Freedom Drive, One Freedom Square, Reston, VA 20190-5601 (US).

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(54) Title: E-COMMERCE SALES SUPPORT SYSTEM USING A VENDOR-SPECIFIC PRODUCT DECISION QUESTIONNAIRE



(57) Abstract: A method for providing online sales support during a sales session between an e-commerce vendor and an online shopper. The method include connecting a customer interaction center to the Internet. Presentation logic is provided to support a human customer service representative in finding products for the shopper in vendors' product databases. The method includes receiving a help request transmitted by the shopper. The presentation logic selects a mapping table from a plurality of mapping tables corresponding to generic product categories used by e-commerce vendors. The mapping table includes entries relating to product criteria that may be used by the vendor to specify their product. The presentation logic uses the mapping table and a product database table, each directed to the same product category selectable by the shopper, to create, populate with content, and push a product questionnaire having a series of Web pages. Each Web page has a customer input portion populated with information from the vendor-specific product database table and is adapted for querying the shopper for their criteria for selecting a product. The content of Web pages included in the questionnaire are determined by the fields of the generic mapping table having inputs with these fields corresponding to fields of the vendor-specific product database table. The vendor's product database is searched using the inputted criteria and the product matches are displayed to the shopper.

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**E-COMMERCE SALES SUPPORT SYSTEM USING  
A VENDOR-SPECIFIC PRODUCT DECISION  
QUESTIONNAIRE**

**BACKGROUND OF THE INVENTION**

5     **1.     Field of the Invention.**

          The present invention relates to the field of providing customer service during a sales session in electronic commerce, i.e., shopping for goods and services over a communications network, such as the Internet, and particularly to a customer service system that provides online shoppers automated or self-assisted customer service and/or  
10    semi-automated customer service that is controlled by a human customer service representative. Both types of customer service utilize a product decision tool with presentation logic that maps fields of relational databases to Web pages of a product selection questionnaire to more efficiently and cost-effectively guide the online shopper through the goods and services provider's electronic catalogue/product database to  
15    locate products that meet the shopper-inputted criteria.

**2.     Relevant Background.**

          An important, growing trend for providers of goods and services is the strategic use of the World Wide Web portion of the Internet to remotely sell to their existing customers and to market to new customers. These remote customers or online shoppers  
20    typically use a Web browser on their Internet-linked node (i.e., personal computer, wireless electronic device, and the like) to visit the Web site of the goods and services providers to shop for specific items and purchase items that meet their needs and criteria. In general, a goal of selling online is to provide a shopping experience or session that is so enjoyable and rewarding for the shopper they are encouraged to  
25    purchase and to become return, online customers. To achieve this goal, it is necessary for the online shopper to be able to efficiently find the items they are looking for and in some cases, to feel as if they are receiving the same or better treatment than if they visited a physical store.

          A key element of providing an online shopping experience that is acceptable to

online shoppers is the provision of high quality customer service and sales support during online shopping sessions. This support or "help" functionality can be provided in an automated fashion or with the use of human or live attendants. In the basic form of the automated mode, the automated help function involves directing a customer to a frequently asked question (FAQ) screen serviced by a knowledgebase. In addition, many early electronic commerce (i.e., e-commerce) sites relied completely on the product and technical knowledge of the shopper which hopefully allowed them to self-assist themselves as they searched a site for the items they wanted and placed the found items in a "shopping cart." While this may have been acceptable for experienced Web navigators who were purchasing simple items such as books and music, this is typically unacceptable for selling more complex and/or expensive products that may have many features (such as furniture, automobiles, financial services, and the like) whose purchase generates questions and requires more assurance prior to purchasing. Additionally, shoppers who are inexperienced with Web navigation generally need more assistance in navigating vendor sites. In both these situations, it is vital that the shopper be able to obtain high quality assistance quickly or they will most likely leave the site without purchasing anything and will either select a competitor's site or stop online shopping altogether. With competitors' sites a click away, e-commerce goods and services providers are continually attempting to match the type of customer service that brick-and-mortar vendors provide because reliance on completely automated customer service comes with the risk of losing their valued customer base.

A number of customer service and sales support systems have developed in an attempt to meet the needs of online vendors and the demands of online shoppers. Most vendor sites include an automated customer service or "help button" that the shopper can select. The online shopper is typically then linked to a new screen or Web page at which they can ask a natural language question and/or find the answers to frequently asked questions (FAQs) that are stored in a database (i.e., a knowledge base). The adequacy of this support is dependent on the quality of the question-answering or help software and the size and quality of the knowledge base often is not well populated due to costs and the newness of the e-commerce site. As a result, a valued customer may receive a nonsensical answer to their question, especially if the question is not asked in

a specific form expected by the help software. Unfortunately, there are some questions that can be answered more effectively by a human customer service representative. Additionally, regardless of the quality of automated customer service, some customers simply demand human interaction and reassurance prior to completing a purchase.

- 5           In response, e-commerce vendors sometimes provide online shoppers with access to human (rather than virtual) customer service representatives who are typically located at a central telephone-computer integrated call center. When an online shopper clicks a live help icon or button, a customer service representative joins their shopping session and interacts with the shopper over the Internet through chat screens or
- 10   dialogue boxes that are displayed on their Web page. The shopper types in their questions, and, in real time (or "live"), the customer service representative responds with an answer or further questions. In this fashion, the consumer is carefully guided through the product selection process. Unfortunately, this manual sales support can be very time consuming, and therefore, expensive, with a customer sales representative
- 15   supporting only one, or possibly two, shoppers at a time. Further, this type of sales support is dependent on the knowledge and skill of the customer sales representative to close sales and to cross-sell and up-sell by suggesting products through asking the right questions and then "pushing" the proper product Web pages, i.e., HTML Web pages (HyperText Markup Language providing and defining hypertext links), to the shopper.
- 20   The e-commerce vendor's product information (e.g., products available, types of each product, price, sizes, colors, and other features) is usually kept in a relational database that must be queried by the customer service representative to find proper Web pages to push to the shopper. If they are too slow in pushing a next Web page or making the next contact, the shopper will lose interest and leave the online site or store. Hence, a
- 25   need exists for a hybrid customer service tool that provides the advantages of the automated and human customer service approaches while addressing the problem areas.

- Both live and automated help and sales support systems involve accessing database information. In general, database solutions are typically implemented in three levels of logic. Initially, a database management system (dBMS), such as a structured
- 30   query language (SQL) server, processes carefully formatted requests to return specified information. Next, business logic implements a variety of functions including functions

that generate the formatted dBMS requests. Then, the business logic interfaces with presentation logic that generates a user interface that is displayed to the online shopper. For example, the presentation logic may generate a Web page that prompts for and accepts user input from a variety of input controls, such as text boxes, pull-down  
5 menus, radio buttons, check boxes, and the like. The business logic receives the shopper's input and generates a request to the dBMS to identify products, services, and/or information that match the shopper's input. The input controls must be customized to match the particular database or the dBMS request will not work, and the input controls typically have to be continually updated as the database contents change.

10 Further, while providing a useful tool for customer service, the e-commerce vendor is faced with the cost and time required to maintain such customer service logic or software architecture and to maintain and update their electronic catalogue (including their product database) with current pricing, availability, and other information for each of their products. This updating requires the vendor to keep the  
15 Web page and corresponding database entries current for each and every product. Typically, this involves hiring specialists in HTML and other software languages who, every time a product is added, deleted, or updated, modifies the vendor's Web server file list, Web pages, and records in their product database.

Further, underlying querying software commands (such as SQL commands) that  
20 are embedded within each custom database interface scheme must be altered or updated. These embedded SQL calls or commands are typically custom written for each vendor database such that when a customer service representative sends instructions in the native language of their Web browser or other interface, a SQL call is forwarded to the database which retrieves the proper records for pushing to the  
25 shopper. Adding to the complexity of the system, the intermediary tier software between the database and the customer service representative's node involves complex application logic including security services, user management logic, business logic, and a processing queue scheme. The development and maintenance of this customer service application software generally requires a relatively large team of specialists and  
30 often is costly and time consuming (which can result in Web sites being periodically down or offline).

Hence, it is a complex and costly task to set up and maintain an electronic commerce Web site that acts as a front end to a vendor's database. As a result, each e-commerce site is typically custom-made and is frequently maintained. Nevertheless, these sites frequently malfunction or breakdown due to mismatches between the vendor's database, the business logic, and the presentation logic. Consequently, there remains a need for methods and systems for providing interactive, real time customer service and sales support to a shopper while they are visiting an e-commerce vendor's Web site. Preferably, the new methods and systems will address the demands of online shoppers for high quality, timely information and support while also addressing the needs of vendors to control their costs and to efficiently update their electronic product catalogues or databases. Additionally, it is preferred that the new methods and systems flexibly map presentation logic to vendor or legacy database systems.

#### **SUMMARY OF THE INVENTION**

To address these problems with prior customer service techniques, the present invention provides a customer service system and method that uniquely blends the functional strength and speed of computer software and hardware in performing automated customer interaction with desirable human interaction with online shoppers. The resulting system and method reduces costs by controlling the time spent by human customer service representatives interacting with shoppers (i.e., increasing the representatives efficiencies) and by providing a hardware and software architecture with reduced complexity (i.e., reduced development and maintenance costs). The customer service system and method provides advantages over fully automated systems by providing for human-controlled sales support, including, for example, cross-selling and up-selling of the e-commerce vendor's goods and providing human assurance during (i.e., in real time) the online shopping session.

The present invention involves a method for providing online sales support during a sales session taking place between an e-commerce vendor and a shopper. Both the vendor and the shopper are connected to and communicating over a communications network, such as the Internet. The vendor typically uses a Web server to provide a Web site and Web pages that the shopper accesses with a node; such as a

personal computer or other electronic Internet access device, that includes a browser. The method includes connecting a customer interaction center to the communications network. A product decision tool with presentation logic is included in the center and is configured for assisting the shopper (e.g., self-assist mode) and, in some embodiments, a human customer service representative (e.g., semi-automated mode) in efficiently finding products of interest to the shopper in the vendor's product database. The method continues with receiving at the customer interaction center an interaction request transmitted by the shopper (e.g., the shopper may select help or service icons on the vendor's Web pages). Next, the product decision tool uses the presentation logic to create a product selection questionnaire that comprise at least one Web page having a customer input portion. The customer input portion is adapted for querying the shopper for their customer criteria for selecting a product (e.g., price ranges, sizes, fabrics/materials, and the like). The method continues with pushing of the selected questionnaire over the communications network.

In a preferred embodiment of the method, the number and content of the Web pages included in the questionnaire are determined, at least in part, by operating the presentation logic to select a mapping table from a plurality of mapping table corresponding to the product categories that may be used by e-commerce vendors. The mapping table is generic for the product category and includes a number of entries or fields related to potential product criteria that may be used by a vendor to specify a product (such as brand, price range, materials, sizes, and the like). A product database table corresponding to the product category is retrieved or accessed by the presentation logic for the particular vendor. This product database table has a number of entries and fields that contain the attributes or product criteria actually used by the vendor for the product category. Because the mapping table has more entries or fields (in most cases), some of the fields are NULL or have no input. The presentation logic next walks through the mapping table generating a customer input Web page for each of the mapping table fields that is not NULL. Significantly, the presentation logic queries the product database table for vendor-specified product criteria (i.e., acceptable specifications for their products) and places these in the input portion of the appropriate customer input Web page. In this manner, the Web pages only contain acceptable input

(i.e., do not on dialogue boxes and the like) and further, the content of each Web page is customized automatically using meta-data from the product database table.

The customer input portion of the Web page queries the shopper for the criteria needed to search the vendor's product database based on the shopper's inputted customer criteria. The product matches can then readily be displayed to the shopper at their node. Significantly, the method can include a human customer service representative controlling initial selection of the mapping table based on the product interest data provided by the shopper (i.e., through response to a direct question or retrieved from their cookie information or shopping session variables obtained from the shopper browsing the vendor's Web site). The human customer service representative may also use the product decision tool to display marketing information to the shopper that is directly related to the matched products (e.g., the matched products are hiking boots so cross marketing techniques include suggesting hiking clothes, camping equipment, and adventure travel packages).

Other features and advantages of the invention, including beneficial structures and uses of the mapping and product database tables, will be more fully understood from studying the drawings and the following description of particular embodiments of the electronic commerce customer service system and method of the present invention.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a functional schematic diagram of an e-commerce sales support system according to the present invention;

FIG. 2 are diagrams showing the interrelationship between and the basic structure of the customer input pages, the mapping table, and the product database table utilized by the product decision tool of FIG. 1;

FIG. 3 is a flow diagram of a customer sales support process according to the invention and executed by the components of the customer service center of FIG. 1;

FIG. 4 illustrates an exemplary e-commerce vendor Web page displayed to an online shopper by the vendor on the online shopping node from which an online



shopper can identify products of interest and can make an interaction or help request;  
and

FIG. 5 illustrates an exemplary customer service Web page displayed to an  
online shopper by the customer interaction center of FIG. 1 to allow live, human  
5 interaction as a part of the customer sales support process of the invention.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring to FIG. 1, an e-commerce sales support system 100 is illustrated that  
is useful for providing real time, interactive (both human-controlled or assisted and  
automated) customer service and support to an online shopper who is attempting to  
10 purchase a product (i.e., goods and/or services) from an e-commerce vendor.  
According to an important aspect of the invention, the sales support system 100 is  
configured for overcoming the problem of high or even prohibitive costs for providing  
fully "live" or human controlled customer service. The sales support system 100 also  
addresses the deficiencies with a fully automated, computerized customer service  
15 system (e.g., customer knows no live support is being produced or available, which  
may be evidenced by questions not being addressed adequately). The sales support  
system 100 provides a simplified software and hardware architecture when compared  
with previous fully live systems while also increasing the efficiency of human customer  
service representatives and providing assurance that no or few inappropriate answers  
20 are given to online shoppers, thereby enhancing the quality of service while also  
reducing associated costs.

Generally, the sales support system 100 includes a customer interaction center  
110 communicatively linked via the Internet 170 (or other communication network)  
with online shopping nodes 160, 164 and with e-commerce vendor 180. The online  
25 shopping nodes 160, 164 are computers or other electronic devices used by shoppers to  
access, with an included browser 162, 166, a vendor Web site and pages provided by  
Web server 184. Although only two shopping nodes 160, 164 and one vendor 180 are  
shown for clarity's sake, the invention is intended for use in providing service to a large  
number of shoppers and vendors. In standard applications, the e-commerce vendor 180

is attempting to sell a variety of products (i.e., goods and/or services) for which records are contained in product database 188. Typically, each of these products can be organized into an item category (e.g., beds, automobiles, mutual funds, hiking boots, shirts, pants, and the like) and then further identified by a finite number of criteria, i.e.,  
5 a constrained set of values. For example, for a hiking boot, the criteria may be price range, size, material, color, and similar criteria.

These product criteria are useful for searching the product database 188 for specific products suited to a shopper's needs (i.e., customer criteria or constraints that are collected by sales support methods executed by the customer interaction center 110,  
10 as will be explained in detail with reference to FIGS. 2 and 3). During operation, a shopper operating one of the nodes 160, 164 will initiate an online shopping session by visiting the e-commerce vendor's Web site and be shown a Web page, such as the Web page 410 of FIG. 4. They may browse specific products by selecting one of the product selection icons 430, which will link them to other vendor Web pages. During this  
15 shopping session, the shopper may select a number of items for later purchase (e.g., place the items in a "shopping cart"). Also, during the shopping session, the shopper may have questions or want support in finding or selecting a product. At this point, the shopper will select a help or interaction request icon 420 on the vendor's Web page 410. This icon 420 links (i.e., is a hyperlink to a URL or Internet address) the shopper  
20 to the customer interaction center 110 which is configured to provide the shopper with sales support and other assistance.

Referring again to FIG. 1, the interaction request is received at the customer interaction center 110 by a service request routing engine 114. This routing engine 114 may be considered an intelligent router that, in one embodiment, determines a priority  
25 rating for the interaction request based on a set of priority rules 116 and thereby, provides a triage service of allocating the resources of the customer interaction center 110 in a predefined manner. In one preferred embodiment, the priority rules 116 include, but are not limited to, the current availability of human customer service representatives 150 (although only one representative 150 is shown a plurality would  
30 typically be included), the value and/or quantity of products selected by the shopper prior to making the interaction request (i.e., is their shopping cart full or above a

- selected dollar amount), and indications that the shopper is a repeat, valued customer. For example, the priority rules 116 may be selected such that any customer is routed to a human customer service representative 150 when the representative 150 is not busy (e.g., capable of handling 3 or 4 shoppers but currently only handling 1 to 3 shoppers).
- 5 Once this priority rating is assigned, the routing device 114 will use this priority rating to decide whether to route the interaction request to one of the customer service representatives (human-controlled or "live") 150 or to an automated service representative 120.

- The customer service representative 150 is typically a node (such as a personal
- 10 computer with a monitor and input device) that is monitored and operated by a person. The automated service representative 120 is a computer, server, and/or similar devices with software designed to automatically provide human-like customer service including asking and responding to questions and finding products in the product database 188. Because the cost of providing personnel to operate the customer service representative
- 15 150, it is desirable to limit the number of these representatives 150 (i.e., not provide fully live services).

- With this goal in mind, priority rules 116 may establish limits on which and how many shoppers are routed to the representative 150. For example, the priority rules 116 may be such that when a representative 150 is not busy (i.e., available) then
- 20 any shopper or interaction request will be routed to that representative 150. If the representative is busy, such as with two shoppers and one waiting, the interaction request is routed to the automated service representative 120. Alternatively, the priority rules 116 may call for certain shoppers to always be sent to a customer service representative 150, such as shoppers with a high value shopping cart or who are repeat
- 25 customers, and some customers to always be sent to an automated service representative 120, such as shoppers who have little or nothing in their shopping carts and/or who have never visited the vendor's site before. To identify the value of the shopping cart items and whether the shopper is a repeat shopper, the routing engine 114 is preferably adapted for processing session variable information that is transmitted
- 30 with the interaction request (such as information from a cookie that identifies the shopper and provides other relevant information).

When the interaction request has a high enough priority rating, the customer service representative 150 receives the request and a human agent begins the process of responding to the interaction request. Referring to FIG. 5, the customer service representative 150 may be operated to push a user interface such as a Web page 510 to the online shopping node 160 or 164 with a dialogue box 520. The dialogue box 520 displays the text of messages transmitted to and from the online shopping node 160, 164 to clearly show that a person is responding to the shopper's help request. Typically, the response will begin with the representative 150 asking what product or item the shopper is looking for or alternatively, this information may be obtained from shopping session variables transmitted with the interaction request (i.e., what item was the shopper last looking at on the vendor 180 Web site).

According to a significant feature of the invention, the customer service representative 150 next utilizes a product decision tool 128 (e.g., a combination of software and hardware) to increase the efficiency and effectiveness of the human-assisted sales support. The product decision tool 128 includes presentation logic 132 for creating and pushing a product decision questionnaire comprising one or more user input screens such as Web pages (see item 220 of FIG. 2) with customer input portions.

The product decision tool 128 also includes a mapping table database 134 including mapping tables 210 for dynamically mapping or matching the number and content of the Web pages 220 of the questionnaire with a product database table 204 corresponding to the product database 188. Each e-commerce vendor 180 or Web site is associated with one or more mapping tables 210. A customer service representative 150 can push a questionnaire comprising a series of Web pages 220 that query the shopper for customer criteria (e.g., a set of user-input data that identifies a set of constraints) that are relevant to the product or item the shopper seeks. This feature of the customer interaction center 110 provides a significant time saving for the person operating the representative 150 who can perform other functions while waiting for the customer to complete the questionnaire (such as service additional interaction requests).

Generally, the mapping tables 210 used by the presentation logic 132 can be thought of as an abstraction of the product database 188 and each has a relatively

uniform schema that is readily queried by the presentation logic 132. The mapping table 210 comprises a plurality of entries or fields 214 with each entry 214 corresponding to a customer input page 220 that may be generated by the presentation logic 132 and pushed to the online shopper. It is contemplated that a product non-specific format or template of a mapping table 210 can be generated for a particular class of goods (e.g., apparel) that can then be used as a guide for multiple e-commerce vendors such as vendor 180. A mapping table 210 can then be customized by providing a pointer in each entry or field 214 that functions to identify the product database table 204 and/or the product database 188. The entries or fields 214 also include one or field names, variable names, object identifications, and the like that are valid within the product database table 204 and/or the product database 188. In operation, the presentation logic walks through the mapping table 210 making queries first against the mapping table 210 and then with the obtained parameters against the product database table 204 and/or product database 188. The presentation logic 132 uses the query results to dynamically customize the content and number of the generic customer input pages 220 presented to the online shopper. Customization according to the invention includes, but is not limited to selecting a graphic to display, selecting product and vendor specific text, constraining a user-input control in a manner appropriate with the product currently under consideration by the online shopper, and the like.

Referring to FIG. 2, a typical layout is provided for a product database table 204, a mapping table 210, and customer input pages 220 that comprise the product decision questionnaire. Additionally, the interrelationship or mapping between these components is indicated by use of arrows. The product database table 204 may be resident in the mapping table database 134 or other memory of the product decision tool 128 or in the product database 188. This table 204 includes a set of product criteria fields 208 containing attributes that uniquely identify each product or item offered by the e-commerce vendor 180, and unique tables 204 with differing fields 208 can be used for each product or item 206. For example, the product or item 206 may be a hiking boot and corresponding product criteria fields 208 may be article\_type, article\_size, article\_material, article\_color, and article\_price, and, of course, these fields 208 would be different for identifying other products such as a financial service

or product.

The product decision questionnaire comprises a series of customer input Web pages 220, which can be thought of as a set of product non-specific (or template) user interfaces. It is desirable that the number and content of these pages 220 be selected by  
5 the presentation logic 132 to solicit and collect only the information (product criteria) needed for searching the product database 188. To this end, the product decision tool 128 includes a mapping table database 134 having a plurality of mapping tables 210 that correspond to categories of goods or services offered by the e-commerce vendor 180. For example, the e-commerce vendor 180 may sell all types of sporting goods, and  
10 a relatively generic mapping table 210 is provided for each of a number of goods categories, such as tents, sleeping bags, cooking equipment, fishing equipment, and apparel. Preferably, the product decision tool 128 has ready access to a listing of all of the categories of goods and services provided by each e-commerce vendor 180 and a mapping table 210 is created and stored in the mapping table database 134  
15 corresponding to each category.

The mapping table 210 includes a category field 212 corresponding to the product categories offered by e-commerce vendor 180. As shown in FIG. 2, the mapping table 210 is for use with apparel. The mapping table 210 generally includes a plurality of customer input fields 214 or attributes that correspond generically (i.e., the  
20 attributes are product non-specific or are unconstrained) to product criteria that potentially may be used in product database tables 204 to identify a product or item within that category. For example, but not as a limitation, to find an item of apparel, the following customer input fields 214 may be useful: input\_item, input\_type, input\_size, input\_material, input\_color, input\_length, input\_width, and input\_price. However,  
25 typically each of these fields 214 are not needed to locate every item of apparel, and it is preferred that only relevant questions be asked of the shopper (and corresponding Web pages pushed to shopper) to collect required customer criteria.

In this regard, the presentation logic 132 of the product decision tool 128 is configured to retrieve or access the proper mapping table 210 based on the product or  
30 item of interest input by the shopper or by the human agent via the customer service

representative 150. Alternatively, this product information may also be obtained with the first Web or input page (not shown) pushed to the shopper at the online shopping node 160 or 164. For example, in one embodiment, the presentation logic 132 includes a generic SQL call to the listing of vendor product and services categories (resident in memory in the product database 188 or in the product decision tool 128). The result set of the query may be apparel, camping gear, and fishing gear. The presentation logic 132 then uses this information to push a Web page with a generic question of "which category of product are you interested in?" to the online shopping node 160, 164. The Web page includes an input control, such as a pulldown box, that is populated with the results of the query (in the above example, apparel, camping gear, and fishing gear). The online shopper selects one of the product categories (such as apparel) and the presentation logic 132 retrieves the mapping table 210 corresponding to the shopper's input. Significantly, the shopper is not presented with a simple text or dialogue box in which they are expected to input the product they are interested in. This is important as the presentation logic 132 only provides correct or valid answers to the shopper. It does not rely on a proper interpretation by a knowledge base-linked software application of the text input by the shopper, and consequently, the present invention provides for a quicker, more efficient customer service session with less risk of a session ending error.

During operation, the shopper inputs customer criteria in response to the questions or queries of each Web page 224-232. The queries typically are displayed to the shopper in a customer input portion of the Web pages 224-232. The input control used to query the shopper may be selected from a number of useful techniques including, but not limited to, pull down menus listing appropriate answers, multiple choice box displays, and graphical "point and click" icons. According to one embodiment of the invention, the presentation logic of the product decision tool 128 is configured to dynamically modify the content of the Web pages 224-232 based on the comparison results to create a more effective customer interaction and better product match rather than relying on relatively generic queries. In this manner, the Web pages 224-232 become constrained, or at least the customer input portion becomes constrained, with the set of constraints obtained in the comparison. In the hiking boot example, the questions can be modified to apply more specifically to hiking boots

rather than general apparel. For example, when asking for size, the provided answers can be shoe sizes rather than shirt or pant sizes and price ranges can be narrowed to be appropriate for the vendor's 180 offered hiking boots. To practice the invention, the amount of customization and modification of the pushed Web pages 224-232 can readily range from none or very little (i.e., use generic pages) to high levels of modification (e.g., using graphical icons that clearly show the vendor's products, only their offered sizes, styles and colors available, and the like).

In general, mapping tables 210 are created to cover a group of related items, such as apparel items. The granularity at which the items are classified is a design choice, and the number of fields 214 included will be larger for more general classifications and smaller for narrower classifications. The mapping table 210 typically has more fields 214 than the product database table 204 resulting in empty or null fields in the mapping table 210 when queries are made to the product database table 204 for which no input is needed from the shopper. In these cases, the presentation logic 132 uniquely creates input pages 220 or question screens as it walks through the mapping table 210 only for the not NULL fields 214. Consequently, a shopper is not presented with questions that are not relevant to the product they are trying to locate and purchase.

Once the mapping table 210 is selected for use, the presentation logic 132 then operates to walk through the mapping table 210. The walk-through process includes selecting proper input pages 220 to push to the online shopping node 160, 164 and modifying the generic pages 220 to include content specific to the vendor 180 and its products. In one embodiment, the content of the input pages 220 is changed so as to be responsive to previously retrieved input from the shopper (historical session data). For example, the next generic screen could have a question that includes a portion of the last customer input (e.g., "Now that we know you want Brand X hiking boots, which of the following sizes would you like?" and the like).

The presentation logic 132 then checks or queries the mapping table 210 to determine the next type of information or attribute needed to be obtained from the customer. As shown in FIG. 2, a query (such as an SQL query) is made to a listing in



the mapping table database 134 or alternatively to the product database 180 to determine "Input\_Items" 214 or subcategories of apparel that are available from the vendor 180. In this example, the Input\_Items 214 represent names of the product database tables 204. The results of this query are used to populate the customer input  
5 portion of the generic Web page 222 pushed to the online shopper. For example, the subcategories of apparel may include shirts, pants, dress shoes, and hiking boots. The presentation logic 132 receives the input (e.g., the shopper selects hiking boots) from the online shopping node 160, 164 and selects a corresponding product database table 204 (e.g., the hiking boot table 204 as shown in FIG. 2).

10 In an alternative embodiment, the presentation logic 132 queries the online shopper more than once prior to selecting a mapping table 210. This is useful in embodiments of the invention which include a larger number of relatively specific mapping tables 210 rather than fewer more generic mapping tables 210. For example, it may be useful to obtain a category and a subcategory of the products offered by vendor  
15 180 to obtain a more specific mapping table. As illustrated in FIG. 2, it may be useful to determine if the shopper is interested in the subcategory of footwear under the apparel category because this would allow a mapping table specific to footwear to be used by the presentation logic in creating and customizing the product decision questionnaire. In this embodiment of a more specific mapping table 210, the fields 214 that are not  
20 relevant to the subcategory are initially set as NULL, and the presentation logic begins the walk-through process and does not push an input page 220 for these NULL fields 214 (such as Input\_Length and Input\_Width which are not mapped to any of the fields 208).

With the product database table 204 for hiking boots 206 retrieved or selected,  
25 the product decision tool 128 then operates the presentation logic 132 to continue the walk-through process of creating and pushing the input pages 220 of the product decision questionnaire. In the illustrated hiking boot example, the customer service representative 150 pushes the questionnaire to the online shopping node 160, 164. The dialogue box 520 of FIG. 5 is updated via the customer service representative 150 to  
30 inform the shopper that their product search can be facilitated by their completing a brief questionnaire. As illustrated in FIG. 2, a series of Web pages 224-232 (with the

query of Web page 222 already being answered) would be sequentially displayed via the browsers 162, 166 to the online shopper. As illustrated, the number of Web pages 224-232 is equal to the number of product criteria 208 in the product database table 210. Null fields 214 are skipped during the mapping process and the Web page  
5 corresponding to these fields 214 is not pushed as part of the product decision questionnaire.

In other words, the product decision tool 128 utilizes presentation logic 132 to dynamically create a presentation layer using one structured query language call per question asked to a shopper in the customer input portion of each pushed Web page.  
10 Each question relates to a table field in the product database table 204. Significantly, this technique of allowing the data structure or layer in the product database 188 to drive the presentation logic allows the present invention to eliminate or at least simplify the intermediary tier software and associated hardware required in fully live customer service systems existing before the system of the present invention. Further, the  
15 dynamic presentation logic 132 is effective regardless of the existing contents of the product database 188. This allows the product decision tool 128 to be used without or with only minimal maintenance even though products are added and deleted from the product database 188. Updates may be required when new product lines are added but not for simple changes in styles. This is true because the mapping tables 210 and the  
20 included fields 214 are selected to be relatively generic and to cover all potential product criteria used by the e-commerce vendor 180.

In one embodiment, the walk-through questionnaire development process includes initially setting the non-relevant fields 214 to NULL. This is done based on comparing the name 206 of the product database table 204 to a lookup table (not  
25 shown) that includes information as to which fields 214 are relevant or useful for the particular item selected by the shopper. As discussed above, the presentation logic 132 then skips over the NULL fields 214 and does not present an input page 220 for these fields 214. The content of each input page 224-232 is retrieved by making a query for every not NULL field 214 to the product database table 204 to obtain the ranges of the  
30 particular product criteria, i.e., acceptable answers for products represented by the product database table 204.

In another embodiment, the number and content of the input pages 220 of the product decision questionnaire are determined dynamically and are customized by the presentation logic 132 as it receives shopper input from the questionnaire. The presentation logic 132 retrieves a mapping table 210 and makes a series of queries to the product database table 204 for appropriate product criteria values and pushes these to the online shopper in the customer input portion of the input pages 220. Significantly, the questions are asked in sequence and the information gathered previously from the online shopper (historical session data) is used to customize the input pages 220 and to narrow the set of product criteria that satisfies the query.

To illustrate, the presentation logic 132 may first query the product database table 204 for all article types (e.g., brand names) under hiking boots and if the result set of product criteria is not NULL it then pushes the result set of product criteria to the online shopping node 160, 164 in input page 224. The presentation logic 132 then uses the input from the online shopping node 160, 164 to form a more restrictive query of the product database table 204, such as all size attributes where the category is hiking boot and the article type is the inputted brand name. If the result set is not NULL, the set of product criteria from this query is used to populate the input page 226 that is pushed by the presentation logic 132 to the online shopping node 160, 164. In this embodiment, the number of pages 220 pushed to the online shopper is controlled in response to receiving input from the online shopper. Customization is occurring as part of populating the customer input portion with query results that meet multiple criteria (for example, the entire range of hiking boot sizes or materials may not be presented to the shopper if they have selected a brand that only makes certain sizes and uses certain materials).

Once the customer criteria are collected from the shopper, the product decision tool 128 can query or search the product database 188 using the customer criteria to quickly locate product matches. Each of the customer's criteria is typically used to search the product database 188, searching for a product that satisfies each and every criterion. In one embodiment, if exact matches are not obtained, second best matches are retrieved (e.g., products that miss on one or two customer criteria such as color or price). The search of the product database 188 provides a result list of matching

products that are then displayed to the shopper who can typically select the products to link to further information or add them to their shopping cart. In a preferred embodiment, the results list is also transmitted to the customer service representative 150 and the operator may update the dialogue box 520 to inform the shopper that the  
5 product icons 532 shown in the results portion 530 represent the products that best match their inputted criteria.

Additionally at this time, the product decision tool 128 preferably is operable to create a marketing information package corresponding to the results list and transmit this package to the customer service representative 150. The package or a portion  
10 thereof is then displayed in a marketing portion 534 of the customer service Web page 510. In this manner, the product decision tool 128 is useful for quickly and efficiently assisting in the cross and up selling of vendor or third party products that a shopper purchasing products on the results list may be interested in (such as, in the hiking boot example, camping or hiking equipment and clothes).

15 Referring again to FIG. 1, if the interaction request does not have a high priority, it is transmitted to the automated service representative 120. The representative 120 generally is an artificial intelligence component that attempts to answer product questions and assist online shoppers in locating products in the product database 188. In one embodiment, the representative 120 imitates a human-controlled  
20 customer service representative 150 and replicates the above discussed sales support process. Specifically, the representative 120 is linked to the product decision tool 128 and can query the shopper for the product or item they desire. This product information is fed to the product decision tool 128 which performs the comparison of a retrieved mapping table 210 with a retrieved product database table 204. The product decision  
25 tool 128 may be configured to automatically push the first page of the questionnaire to the shopper or the automated service representative 120 can operate to push the questionnaire. As discussed above, the collected customer criteria are used to search the product database 188 and the result list displayed to the shopper.

If the shopper has questions they want answered prior to selecting a product, the  
30 automated service representative 120 operates to interpret their question (e.g., natural

language processing or other methodologies many of which are known to persons skilled in the art) and query the knowledge base 124. The knowledge base 124 generally is a memory component that may contain a wide variety of information useful for answering shopper questions, such as answers to Frequently Asked Questions (FAQ's), product information, vendor information, and numerous other types of information. The answer retrieved from the knowledge base 124 is then transmitted to the shopper at the online shopping node 160, 164. While providing relatively effective customer service in an automated mode, this type of service is directly tied to and limited by the quality of the artificial intelligence component in understanding the question and the depth and quality of the information in the knowledge base 124.

In response to these limitations, the customer interaction center 110 includes a triage agent 140 which is typically a human-controlled node through which a person can receive and respond to the shopper's question. During operation, the automated service representative 120 is operable to test the adequacy of the answer to the question obtained from the knowledge database 124 prior to its transmittal to ensure that nonsensical answers are not transmitted to the shopper. If an answer is determined to be inadequate, the question is transmitted to the triage agent 140 and the human operator provides a substitute answer based on their knowledge and/or on a query to the knowledge base 124. This substitute answer is then transmitted to the shopper by the automated service representative 120. Preferably, the knowledge base 124 is updated to include at least some of the answers to the questions that were transmitted to the triage agent 140 to populate the knowledge base 124 with answers to shopper questions and improve future operations of the automated service representative 120.

Referring now to FIG. 3, a sales support process 300 executed by the components of the customer interaction center 110 is illustrated. The sales support process 300 is initiated at 302 such as by placing a help icon on a vendor's Web page. At 306, an online shopper selects the help icon and is linked to the interaction customer center 110. At 310, the priority of the customer or interaction request is determined based on a set of priority rules 116. If the shopper is not considered a priority customer at 310, an automated customer service process is initiated at 314 to respond to the shopper's questions.

At 318, the knowledge base 124 is accessed to obtain an answer to the shopper's question (as interpreted by the automated service representative 120). The acceptability of the obtained answer is tested at 322, and if not acceptable, the question is sent to a human-controlled triage agent 140 for answering. If the triage agent 140 cannot quickly determine an acceptable answer and the question and/or shopper are identified as important, the triage agent 140 will initiate a live customer sales session at 350 by transferring the shopper to a customer service representative 150.

Once the question is answered acceptably, the automated service representative 120 queries the shopper at 330 to determine whether the shopper is interested in locating a specific product. If not, the sales support session is ended at 342 and the shopper returned to the vendor's Web site. If yes, an automated product decision process is initiated at 334 including determining the product the shopper desires and transmitting this information to the product decision tool 128. The tool 128 then selects and retrieves the appropriate questionnaire, mapping table 210, and product database table 204. A walk-through process (as discussed in detail previously) is completed using the mapping table 210 and the product database table 204 and the results mapped to the questionnaire to select the number and content of the Web pages of the questionnaire. The questionnaire is pushed to the shopper who then inputs their customer criteria. The customer criteria are gathered by the product decision tool 128 and used to query the product database 188 producing a matching product list or result list. This list is then displayed to the shopper. At 338, the shopper can request live support prior to selecting or purchasing a product to initiate at 350 a live customer sales session, or they can end the session at 342.

If the shopper is determined a priority customer at 310, a live customer sales support session is initiated at 350 with the transfer of the shopper or their interaction request to the customer service representative 150. The proper customer input questionnaire is determined at 354. This identification may include reading session variables or cookie information transmitted with the interaction request (i.e., the shopper was viewing a specific product line, such as beds on the vendor's site) or by querying the shopper. With the product information, the product decision tool 128 can be instructed, as discussed above, to retrieve the proper mapping table 210 and product

database table 204, complete a product decision walk-through to mapping table 210, and map the results to the questionnaire to modify the number and content of the Web pages included in the identified questionnaire.

At 358, the modified questionnaire is pushed to the shopper. The shopper  
5 inputs the customer criteria requested in customer input portions of each questionnaire Web page. At 362, the customer input is applied to the product database 188 to identify matching products and obtain a result list. The matching products are displayed to the shopper at 366, and at 370, cross and up selling is completed by displaying to the  
10 shopper information on other products located by the product decision tool 128 based on the retrieved, matching products. The sales support session is then ended at 342.

Although the invention has been described and illustrated with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example, and that numerous changes in the combination and arrangement of parts can be resorted to by those skilled in the art without departing from the spirit and scope  
15 of the invention, as hereinafter claimed.

**WE CLAIM:**

1. A method for providing an online user interface comprising:  
providing a product database comprising data about a plurality of products, with each product associated with a plurality of attributes, wherein each attribute can take on  
5 a constrained set of values;  
generating a user interface having a plurality of user-input controls for accepting user input;  
providing a mapping table having a plurality of entries wherein at least one of the entries corresponds to one of the user-input controls and the at least one entry has a  
10 value pointing to one of the attributes in the product database;  
determining a set of constraints for the attribute pointed to by the value of the at least one entry;  
automatically constraining the user input control associated with the at least one mapping table entry using the determined set of constraints.
- 15 2. The method of claim 1 wherein the step of determining comprises generating a query against the product database using the at least one entry to identify the constrained set of values for the attribute pointed to by the value of the at least one entry.
3. The method of claim 1 wherein the step of determining is performed  
20 each time a user interface is generated.
4. The method of claim 1 wherein the generating of the user interface comprises dynamically generating a web page having the user-input controls therein.
5. The method of claim 1 wherein the generating the user interface comprises:  
25 storing a product non-specific template interface including a plurality of unconstrained user-input controls; and  
using the determined set of constraints to modify the unconstrained user-input controls to be constrained controls.
6. The method of claim 1 further comprising:  
30 allowing a user to input data using the user-input controls;  
using the user-input data to generate a valid query against the product database;



and

returning the query results to the user.

7. The method of claim 1 further comprising:

storing a plurality of product non-specific template interfaces, each non-specific  
5 template being associated with one of the mapping table entries.

8. The method of claim 7 wherein the generating the user interface further  
comprises:

determining for each entry in the mapping table whether a value exists for the  
entry; and for

10 each entry for which a value does not exist, skipping the determining of the set  
of constraints and the automatic constraining.

9. A method for providing online sales support during a sales session  
occurring on a communications network between an e-commerce vendor and a shopper  
that are both connected to the communications network, comprising:

15 connecting a customer interaction center including a product decision tool with  
presentation logic to the communications network;

receiving at the customer interaction center an interaction request transmitted by  
the shopper;

using the presentation logic, creating a product selection questionnaire  
20 comprising at least one Web page having a customer input portion, wherein the  
customer input portion is configured for querying the shopper for customer criteria; and  
pushing the product selection questionnaire over the communications network  
to the shopper.

10. The method of claim 9, wherein the product decision tool includes a  
25 mapping table comprising fields that correspond to generic customer input pages, and  
wherein the creating includes identifying the fields of the mapping table that are not  
null and selecting the generic customer input pages corresponding to the identified  
fields to be the Web pages of the product selection questionnaire

11. The method of claim 10, wherein the creating further includes querying  
30 fields of a product database table, corresponding to products represented in a product  
database of the e-commerce vendor, to retrieve vendor assigned product criteria, the  
querying of the product database table being performed for each of the identified fields

of the mapping table, and wherein the creating further includes customizing the customer input portion by providing the retrieved vendor assigned product criteria.

12. The method of claim 11, further including monitoring interaction of the shopper with the pushed questionnaire, retrieving the customer criteria, querying a product database of the e-commerce vendor to locate products that match the customer criteria, and displaying the matched products from the querying to the shopper.

13. The method of claim 12, further including displaying marketing information related to the matched products to the shopper.

14. The method of claim 12, wherein the pushing of the product selection questionnaire comprises pushing sequentially pushing the Web pages and customizing sequentially-later of the Web pages with the retrieved customer criteria.

15. The method of claim 9, wherein performance of the creating and the pushing are controlled by a human customer service representative.

16. The method of claim 10, wherein the mapping table is selected during the creating of the product selection questionnaire by the product decision tool choosing from a plurality of the mapping tables based on product interest data obtained from the shopper.

17. The method of claim 16, wherein the selecting of the mapping table includes interactively querying the shopper over the communications network for the product interest data.

18. The method of claim 16, wherein the selecting of the mapping table includes processing session variables received during the receiving of the interaction request and including the product interest data.

19. A method of producing a product decision questionnaire for use in assisting an online shopper in locating a product of interest in an online vendor product database, comprising:

providing presentation logic adapted for querying relational databases and for creating customer input pages;

communicatively linking the presentation logic with the product database, wherein the product database includes a product database table for each of a plurality of product categories, the product database table comprising a listing of vendor-specified product criteria;

operating the presentation logic to retrieve a customer-specified product category from the online shopper;

selecting a mapping table for the customer-specified product category, the mapping table comprising a relational database having a plurality of entries  
5 representing a generic listing of the vendor-specified product criteria;

selecting one of the product database tables based on the retrieved customer-specified product category; and

using the presentation logic to generate a customer input page to push to the online shopper for each of the entries in the mapping table having an input, wherein the  
10 entries having an input correspond to the product criteria of the selected product database table.

20. The method of claim 19, wherein the operating step includes querying a product categories listing for the online vendor product database to retrieve a plurality of vendor-appropriate product categories and presenting the retrieved vendor-  
15 appropriate product categories to the online shopper.

21. The method of claim 19, wherein the customer input pages include an input portion for displaying a subset of the vendor-specified product criteria from the product database table and wherein the using step includes querying the product database table for the entries in the mapping table having an input to obtain the subset  
20 of the vendor-specified product criteria and the generated customer input pages include the subset of the vendor-specified product criteria in the input portion.

22. The method of claim 21, wherein the displayed vendor-specified product criteria are selectable by the online shopper.

23. The method of claim 22, wherein the using step includes monitoring  
25 pushed ones of customer input pages to retrieve and store selected ones of the displayed vendor-specified product criteria and customizing, prior to pushing, the customer input pages during the generation with the retrieved vendor-specified product criteria.

24. An online customer service system, comprising:  
a customer interaction center communicatively linked to a communications  
30 network adapted for communicating with online shoppers linked to the communications network;

a memory device including a plurality of mapping tables corresponding to a

plurality of product categories in a vendor product database, wherein each of the mapping tables comprises entries relating to a generic list of product criteria for each of the product categories; and

5 presentation logic in communication with the customer interaction center for generating, in response to the communications with the online shoppers, product decision questionnaires comprising at least one customer input page having an input portion and for pushing the generated customer input pages to the online shoppers;

wherein the presentation logic is configured for selecting one of the mapping tables from the memory device based on a product category query to an online shopper  
10 and for generating and pushing one of the customer input pages for each of the entries in the selected mapping table that includes an input.

25. The system of claim 24, wherein the input-including entries of the selected mapping table correspond in number and relative content to entries in a product database table related to the online shopper-specified product category in the  
15 vendor product database.

26. The system of claim 25, wherein the input portion of the customer input pages comprises product criteria retrieved by the presentation logic from the entries of the product database table.

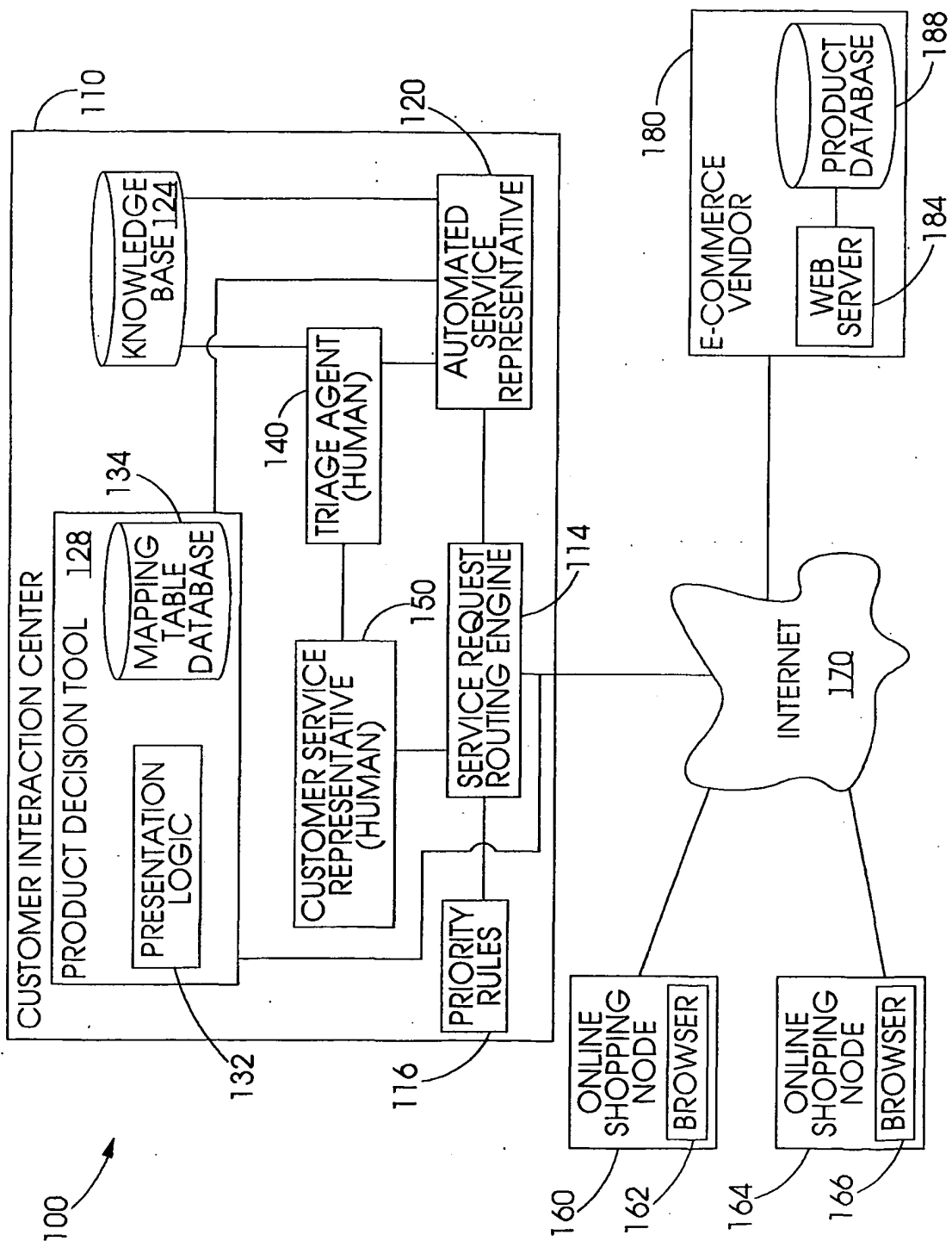
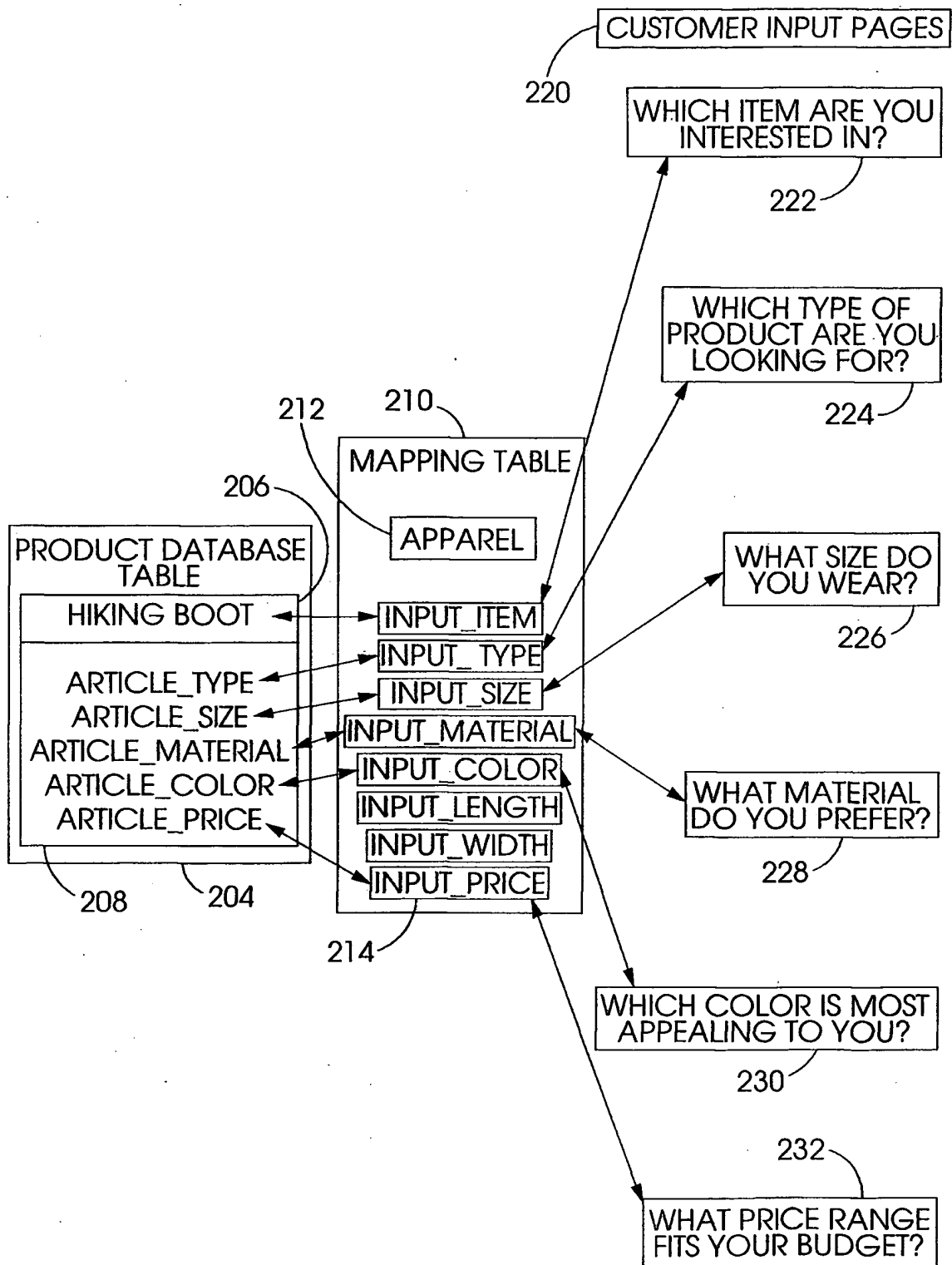
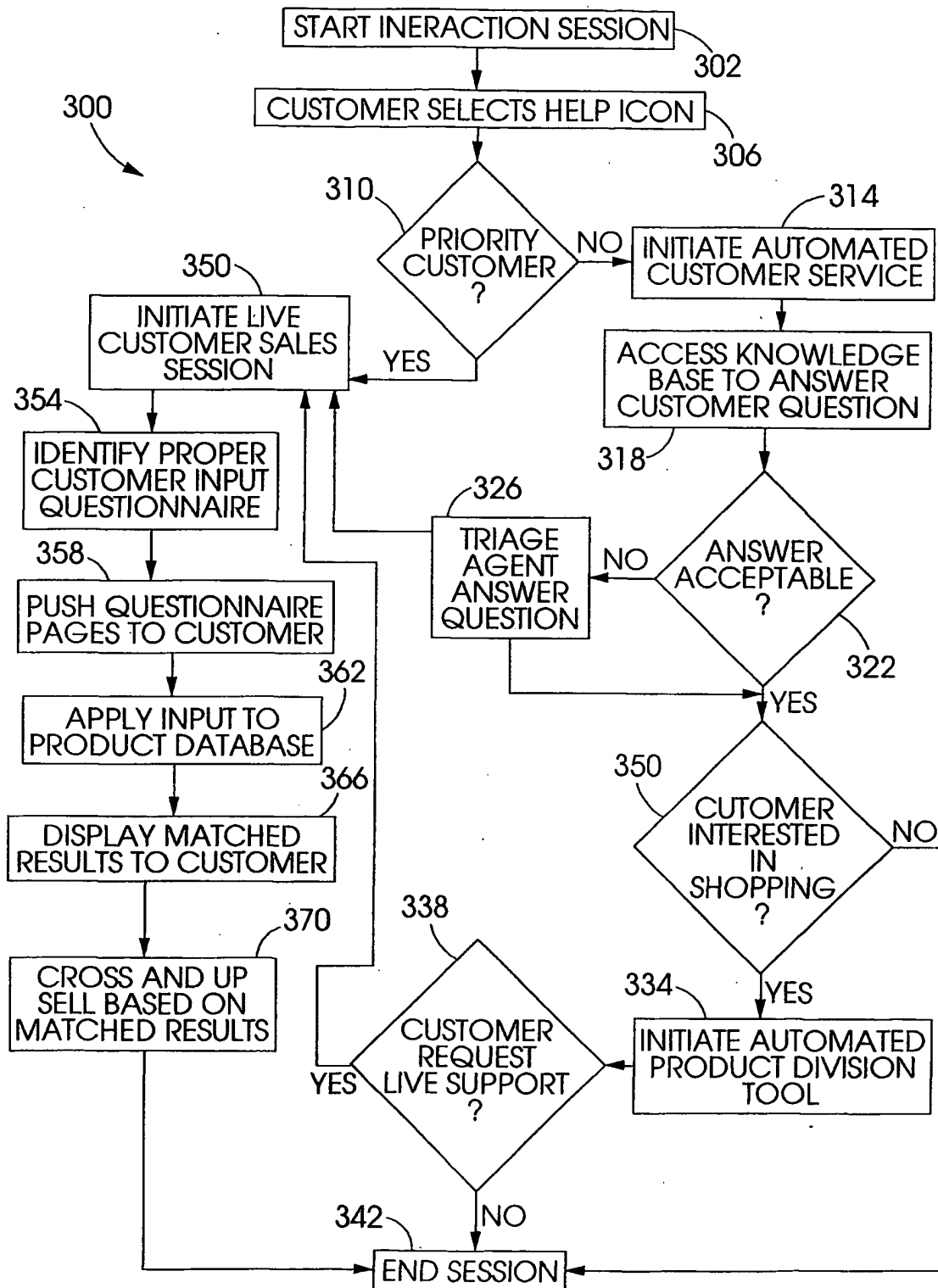


Figure 1

*Figure 2*

*Figure 3*

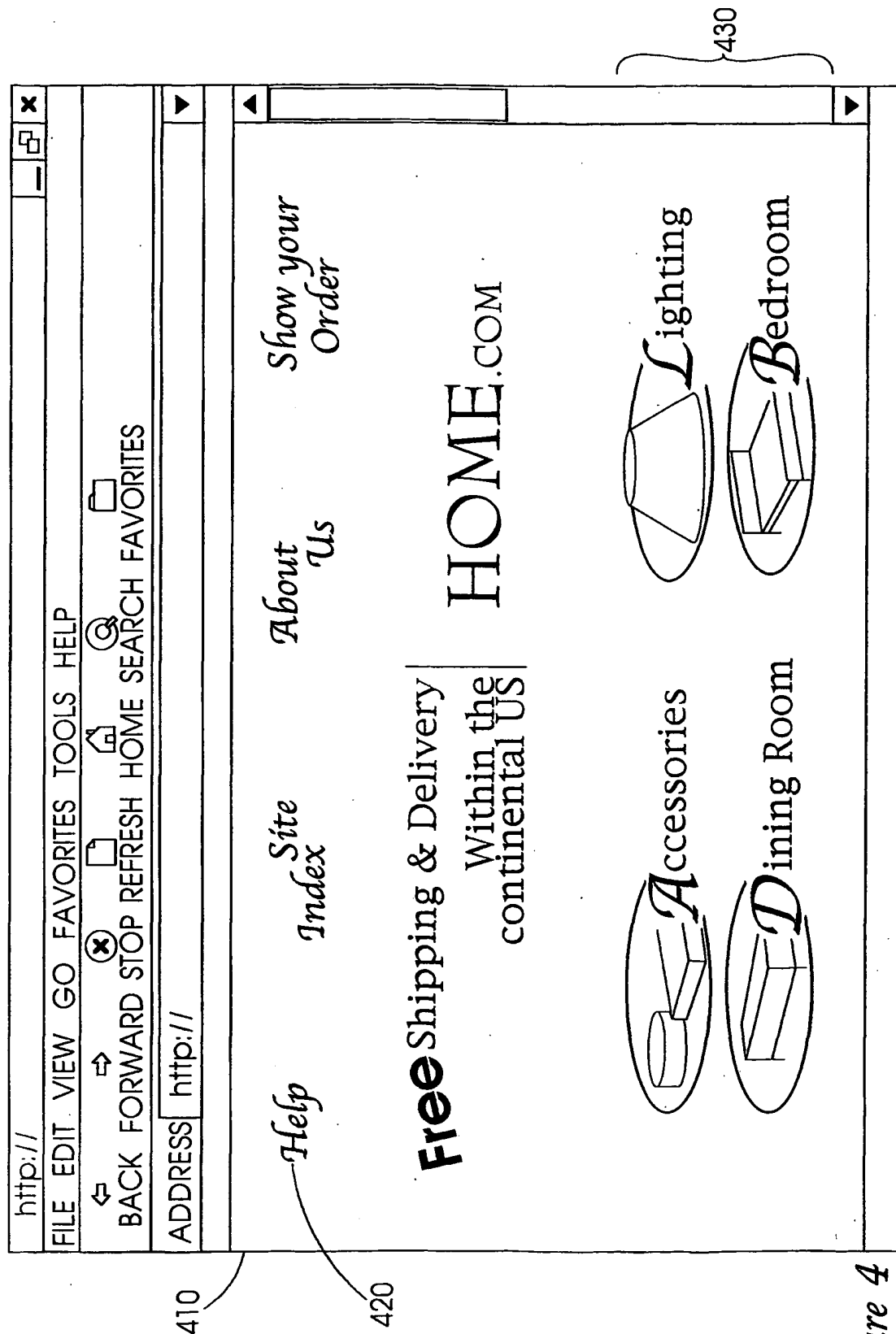


Figure 4



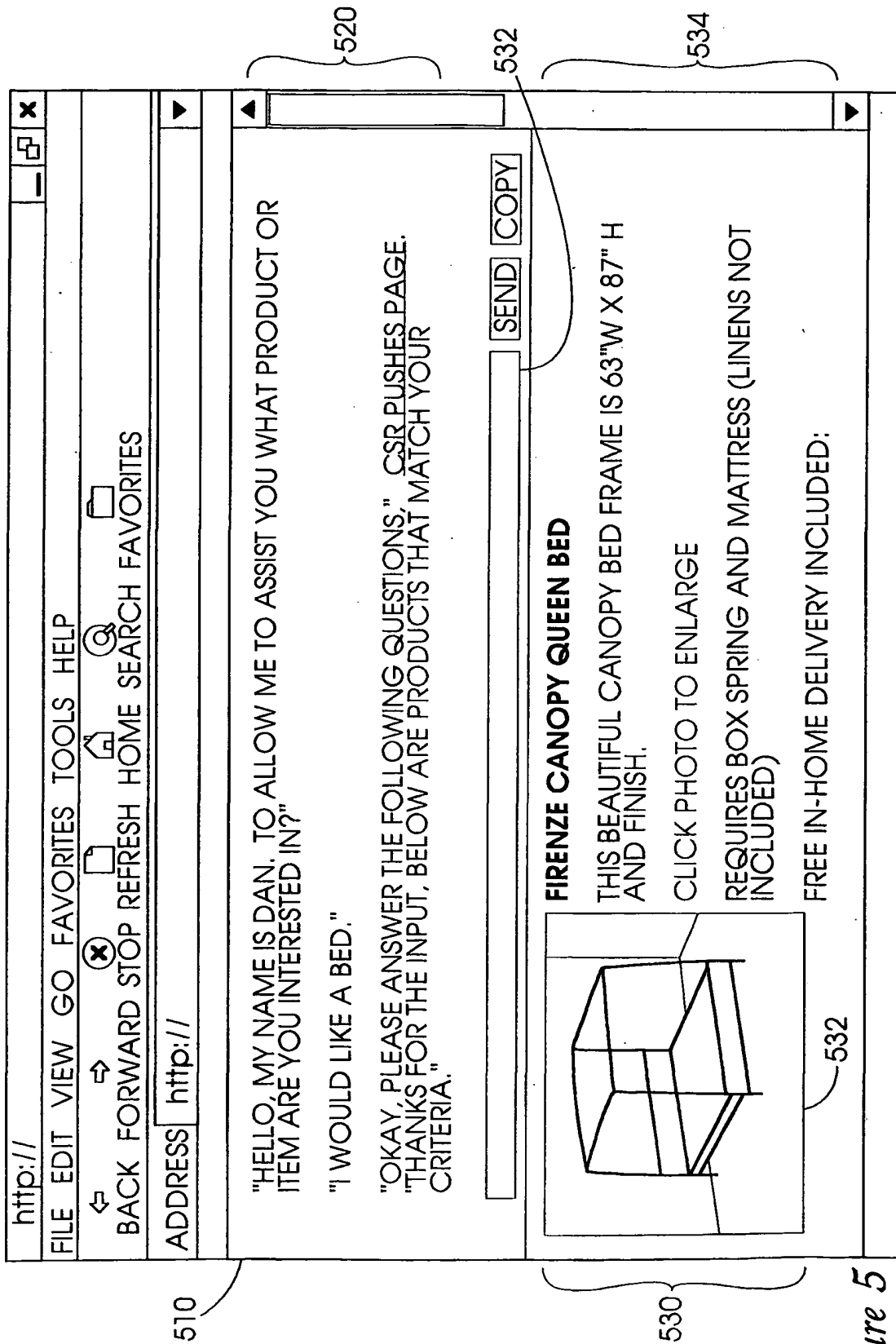


Figure 5